

## **REMARKS**

Reconsideration of this application, as amended, is respectfully requested.

Initially, the Examiner states that the oath or declaration is defective, and requires a new oath in compliance with 37 C.F.R. 1.67(a) because the clause regarding “willful false statements” required by 37 C.F.R. 1.68 has been omitted. It appears that the one page including the “willful false statements” clause was accidentally omitted in the response of June 13, 2002, to the Notice File Missing parts. Applicants respectfully re-submit the declaration and respectfully request that the objection to the oath be withdrawn.

The Examiner objects to the claims because of minor informalities. Specifically, the Examiner objects to claim 1 because the language “squeegees” is used, and a space is required between “squeegee” and “urges”. Claim 1 has been amended accordingly.

The Examiner objects to claims 5 and 6 under 37 C.F.R. 1.75(c), as being of improper independent form for failing to further limit the subject matter of a previous claim. Claims 5 and 6 have been amended as suggested by the Examiner. Accordingly, Applicants respectfully request that the objection to the claims be withdrawn.

The Examiner rejects claims 1-6 under 35 U.S.C. §103(a) as being allegedly unpatentable over U.S. Patent No. 6,036,084 to Yagi et al. (hereinafter “Yagi”) in view of U.S. Patent Publication No. 2001/0042779 to Amita et al. (hereinafter “Amita”) or U.S. Patent No. 6,360,939 to Paruchuri et al. (hereinafter “Paruchuri”).

Regarding the §103(a) rejection, the Examiner alleges that Yagi teaches a process for printing onto the lands of a board that electronic components are subsequently mounted onto, and that during screen printing a solder mask or screen is placed in position over the board and a squeegee is used to spread or roll the solder across the mask so that the board is coated with

paste that spreads through the screen. The Examiner additionally alleges that Yagi teaches reducing the humidity to a level of 20% or less, and that nitrogen may be mixed with the dry air being supplied to the printing process.

The Examiner concedes that Yagi fails to disclose using an Sn-Zn based lead-free solder paste, but alleges that Amita and Paruchuri teach such a paste. Therefore, as per the Examiner, it would have been obvious to one of ordinary skill in the art to combine the references, allegedly rendering the present invention obvious.

However, the present invention, as recited in independent claims 1 and 4, is directed to a solder paste printing method and apparatus that is able to maintain the moisture in the atmosphere at a predetermined value. The inventors of the present invention found that the viscosity of the flux in Sn-Zn solder is closely related with moisture in the atmosphere. The present invention maintains the moisture at a value equal to or less than a predetermined value. The present invention provides an advantage that the deterioration in the solder quality can be prolonged.

On the other hand, Yagi fails to discuss the moisture in the atmosphere. Yagi discloses reducing the humidity to a level of 20% or less in order to prevent the generation of a solder ball. Yagi, in Col. 4, lines 58-59, states specifically, “The use of dry air having a humidity of 20% or less further prevents the generation of use of solder balls.” Yagi fails to disclose maintaining the moisture in the atmosphere to be equal or less than a predetermined value.

As mentioned previously, the inventors of the present invention found that viscosity of the flux in Sn-Zn solder is closely related with moisture in the atmosphere. As Yagi fails to discuss Sn-Zn solder, as conceded by the Examiner, it cannot disclose the relation between moisture in the atmosphere and the Sn-Zn solder. Therefore, one of ordinary skill in the art

would not be motivated to look at the references of Amita or Paruchuri to combine the Sn-Zn solder with the teachings of Yagi.


Even if one of ordinary skill in the art would combine the references, i.e., maintaining the humidity at a level of 20% or less as taught by Yagi, combined with the Sn-Zn solder paste of Amita and Paruchuri, it would still fail to make obvious the present invention as recited in the claims. The present invention is directed to maintaining moisture in the atmosphere, not the humidity. Maintaining the humidity, as taught by Yagi, does not suppress an increase in the viscosity of the flux of the Sn-Zn solder, because a change in the temperature while maintaining the humidity would cause the moisture per unit cube to fluctuate. Thus, Yagi cannot maintain the moisture at a predetermined level. The present invention makes it possible to suppress the increase in the viscosity of the flux of the Sn-Zn solder by maintaining the moisture in the atmosphere.

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). The Examiner has not cited any references that teach maintaining the moisture in the atmosphere surrounding a Sn-Zn solder at a predetermined value.

Therefore, Applicants respectfully submit that the Examiner has not met his burden of establishing a prima facie case of obviousness based on the prior art under 35 U.S.C. §103(a); no objective teaching in Yagi, individually or in combination with Amita or Paruchuri, would lead an individual of ordinary skill in the art to produce the present invention. As such, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection, and allowance of the claims.

In view of the above, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicants' attorney would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,



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